October 12, 2018

Grace Power
NJBPU Chief of Staff
Energy Master Plan Chair

Dear Energy Master Plan Chair Grace Power,

Thank you for the opportunity to comment on the development of New Jersey's newest Energy Master Plan (EMP). Schneider Electric encourages New Jersey to incorporate a high level of energy efficiency while also leveraging new advances in energy technology.

Schneider Electric is leading the Digital Transformation of Energy Management and Automation in Homes, Buildings, Data Centers, Infrastructure, and Industries. We provide integrated efficiency solutions, combining energy, automation, and software. We believe that great people and partners make Schneider a great company and that our commitment to Innovation, Diversity, and Sustainability ensures that Life Is On everywhere, for everyone, and at every moment. There are over 500 Schneider Electric employees in the state of New Jersey.

We have only a few comments in response to specific discussion points asked during the stakeholder meetings:

Reducing Energy Consumption Stakeholder Meeting Discussion Points

Question 1: What energy efficiency, peak demand reduction, and demand response programs and systems will assist in helping keep energy affordable for all customer classes, especially as technology advances in areas such as electric vehicles or heating and cooling, which will potentially increase electric energy usage?

> Energy efficiency still reigns supreme as the least expensive and most abundant energy resource. It doesn't generate as many headlines as newer resources like fuel cells, natural gas, or solar, but energy efficiency's impact on productivity has kept U.S. electricity demand flat since 2007 even while GDP rises. Efficiency will become more critical as electrification and digital technologies significantly increase electricity consumption.
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> Efficiency potential is highly fragmented with an abundance of technologies that can be used across all sectors of the economy. A comprehensive efficiency plan crafted to achieve meeting a target energy savings goal can help the state strategically approach its savings potential. The plan should evaluate the impact of various policies, programs and activities; such as codes & standards, incentives, and financing.

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We encourage New Jersey to also review the “Business Support for Energy Efficiency and Demand Response in the New Jersey Master Plan” comments supported by Schneider Electric and other businesses with investments in the state.

Question 6: What advances in technology should be considered as part of a strategy to reduce energy consumption? What technologies could complement and advance existing energy efficiency efforts?

On a daily basis the energy consumed in water and wastewater utilities approaches between 4 to 6 percent of the total daily power generation capacity of the US. In monetary terms the energy used in these sectors is upwards of $40 billion annually. Schneider believes there is much potential in saving both energy and water in this sector.

Traditional surface water plants use very little energy, except for withdrawal pumping and subsequently delivery pumping of the treated water. There are exceptions like when cheap and convenient raw water is spoken for and treatments migrate to desalination or some other form of pressurized membrane treatment which are significant energy users. Across the water world the latter category is not that pervasive, except for coastal areas of Florida, South Texas, and California. Energy use mitigation and recovery is routinely implemented in the membrane treatment category where there is an incentive for energy recovery and economic return. With respect to pumping, implementing smart technologies, sophisticated integrated instrumentation and controls that utilize artificial intelligence should be considered as the prime strategy to reduce energy use.

Wastewater is unique because each plant is a “one off” - the design characteristics are different based on the influent untreated wastewater flows and organic strength. A typical problem with wastewater plants is they are often required to overdesign and can be factored up 3 to 5 times to address capacity rules. This inherently makes the plant an inefficient energy hog because all processes, pumps and appurtenances are over designed, and have no ability to turn down to save energy use. The best and most opportune strategy to reduce energy consumption should be a focused optimization of all processes to be able to flow pace with the influent wastewater flows and characteristics. This action in itself will result in savings of 20 to 25 percent energy use. New Jersey should consider how to encourage process optimization whenever the 5-year permit life cycle renewal is made for each plant.

What technologies… On the water side, utilization of smart controls with artificial intelligence have the ability to minimize the specific energy ratio and will go a long way towards complementing the current rudimentary and fragmented protocols of replacing motors for high efficiency units, or placing speed control devices to minimize energy use, both actions achieve minimal benefits.

On the wastewater side, options are available that drive the energy use down, possibly to net zero energy use. One option is to implement a forward-looking controls protocol that is customized to the plant and has built in algorithms with the ability to predict the amount of oxygen necessary to provide optimized biological treatment. By employing such controls and complementary aeration technologies the energy footprint of the plant can be reduced by to 30 to 50 percent.

Another idea is that large wastewater plants (10 plus million gallons per day) can create energy from the biosolids or sludge. Substituting aerobic digestion with anaerobic digestion can generate methane that may be used for creating power, LNG for rolling stock fleets, or pipeline grade gas. This action will reduce the carbon footprint of the facility, as well as, utilize the high strength food and commercial organic waste to boost energy recovery and reduce the use of landfills, not to mention savings in transportation and disposal costs currently incurred by the high strength waste generators and industry.

1. “U.S. Microgrids 2017: Market Drivers, Analysis and Forecast. Detailed Segmentation and Ownership Trends.” Colleen Metelitsa, Analyst for GTM Research. November 2017.

Question 8: How do we best utilize data analytics for energy efficiency?
Question 9: What is the role of block chain, IoT, big data, 5G, and other specific technologies in energy efficiency?

> As the leader in the Digital Transformation of Energy Management and Automation in Homes, Buildings, Data Centers, Infrastructure and Industries, Schneider Electric knows that connectivity is a means to ensure energy efficiency. Technology today can gather together all the devices that previously operated separately, to achieve a single, interoperable system. Data can be translated into actionable insights that, in addition to reducing energy waste, can offer preventative services to improve maintenance and reduce risk of downtime.
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> Consumer, commercial, and industrial devices are more intelligent today and capable of computing problems that in the past required a large processor. Better technology, then, is shifting certain types of power consumption to a more distributed model often called the "edge." The implications and potential of the edge should be considered when planning energy efficiency efforts.

<u>Sustainable and Resilient Infrastructure Stakeholder Meeting Discussion Points</u>

Question 6: What steps are needed for to preserve the integrity of our energy systems in the face of future acts of nature (storms, hurricanes, wind, etc.)?

> Distributed energy resources like microgrids can keep power flowing to citizens by islanding when the central grid fails. Microgrids are a promising technology to mitigate the negative impacts of dangerous weather events, but they have not reached their full potential primarily because of financial and regulatory barriers such as utility franchise rights and risk of being subject to utility commissioner regulation[1]. New Jersey should also consider how it can encourage and benefit from potential technology advances, such as neighbors selling power to neighbors via blockchain.

We look forward to other opportunities to further share our expertise and encourage you to reach out to us with any questions.

Sincerely,

Stephanie Byrd
Director of State Affairs
Schneider Electric U.S.A.

1. "U.S. Microgrids 2017: Market Drivers, Analysis and Forecast. Detailed Segmentation and Ownership Trends." Colleen Metelitsa, Analyst for GTM Research. November 2017.